

REMARKS

Prior to entry of this amendment, claims 1-20 are pending in the subject application. By the instant amendment, claims 1, 7, 13, and 15 are amended, claims 11, 12, 14, and 17 are cancelled, and claims 21-24 are added. Claims 1, 7 and 13 are independent.

The amendments to claim 1 are supported at least by paragraphs [0050]-[0051] and [0054] of the original specification as filed. The amendments to claims 7 and 13 are supported at least by original claims 11, 14, and 17. The amendment to claim 15 is to correct dependency thereof. New claims 21-24 are supported at least by paragraphs [0049], [0051], and [0054] of the original specification as filed, respectively. No new matter is added.

Applicants respectfully request, in connection with the next Office action, that the Examiner indicate the acceptability of the drawings filed on January 26, 2004.

A. Summary of Outstanding Rejections

In the Advisory Action dated April 8, 2008,

- (a) rejection of claims 1-4, 6-10, 12-16, and 18 under 35 U.S.C. § 103(a) as being unpatentable over Japan Patent Abstract No. 2001-138272 to Jinichi (“the Jinichi reference”) in view of “Mechanism and Control of a Leg-Wheel Hybrid Mobile Robot,” Proceedings of the 1999 IEE/RSJ, 1999 IEEE to Adachi et al. (“the Adachi et al. reference”) was maintained;
- (b) rejection of claims 19 and 20 under 35 U.S.C. § 103(a) as being unpatentable over the Jinichi reference in view the Adachi et al. reference and further in view of U.S. Patent Publication No. 2003/0114960 to Takenaka et al. (“the Takenaka et al. reference”) was maintained; and
- (c) objection of claims 5, 11, and 17 as being dependent upon a rejected base claim was maintained, but would be allowable if rewritten in independent

form including all of the limitations of the base claim and any intervening claims.

B. Applicant Initiated Interview Summary

On May 30, 2008, an applicant initiated interview was conducted. Applicants appreciate the courtesies extended to applicants' representative by Examiner Christine M. Behncke during the May 30, 2008, interview. As required by 37 C.F.R. § 1.133(b), applicants' summary of the interview is as follows:

1. Brief Description of any Exhibit Shown

No exhibit was shown or demonstrated during the May 30, 2008, interview.

2. Identification of the Claims Discussed

The Examiner and applicants' representative discussed independent claims 1, 7, 13, as previously filed, and claim amendments.

3. Identification of the Specific Prior Art Discussed

The Examiner and applicants' representative discussed the Adachi et al. reference and the Jinichi et al. reference.

4. Summary of the Arguments Presented to the Examiner

Applicants' representative presented arguments regarding interpretation of the "slope detection means" and combination of the cited prior art references. In particular, applicants' representative asserted that the Adachi et al. reference fails to disclose a slope detection means that senses a slope of the floor that is substantially under the two or more legs of the ambulatory robot because the Adachi et al. reference teaches an ultrasonic sensor that cannot sense changes in a vertical direction, i.e., slope, under the robot's legs. Further, applicants' representative asserted that the Adachi et al. reference and the Jinichi et al. reference cannot be combined because incorporation of an arm with an ultrasonic sensor as

taught by the Adachi et al. reference would hinder motion, e.g., walking, of the two-legged robot of the Jinchi et al. reference.

5. General Indication of Other Pertinent Matters Discussed

No other pertinent matters were discussed.

6. General Outcome of the Interview

Examiner Christine M. Behncke indicated that she understood the arguments advanced by applicants' representative, but stated that they are insufficient to overcome the outstanding rejection. In particular, the Examiner indicated that she would maintain the rejection unless claims 1, 7, and 13 are amended. No agreement regarding potential claim amendments was reached.

C. Asserted Obviousness Rejection of Claims 1-4, 6-10, 12-16, and 18

In the outstanding Office Action Made Final, claims 1-4, 6-10, 12-16, and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Jinichi reference in view of the Adachi et al. reference. Applicants respectfully traverse this rejection for at least the reasons set forth below.

No *prima facie* of Obviousness Exists

Independent claim 1 has been amended to recite that at an ambulatory robot includes, *inter alia*,

a slope-detection means for sensing a slope of a floor, the slope of the floor being defined *only directly under the two or more legs* of the ambulatory robot; [and]

control means... wherein the control means controls a speed of revolution of the rotating means *and a speed of motion of the two or more legs of the ambulatory robot based on the slope of the floor...*

Applicants respectfully submit that the Jinichi et al. and the Adachi et al. references, whether alone or in combination, fail to disclose or even remotely suggest an ambulatory robot as currently recited in claim 1. Since a *prima facie* case of obviousness under 35

U.S.C. § 103(a) requires that all of the claim features be shown in the references, applicants respectfully submit that no proper *prima facie* case of obviousness has been established with respect to claim 1 for at least this reason.

With respect to the assertion on page 2 of the Advisory Action of April 8, 2008, that the sensor of the Adachi et al. reference can detect slopes, applicants respectfully disagree. Applicants respectfully note that the Adachi et al. reference teaches an ultrasonic sensor that rotates around a vertical axis of a robot body to measure a terrain altitude around the robot body.¹ Applicants further note that an ultrasonic sensor detects objects by transmitting an ultrasonic pulse in a predetermined direction and receiving a reflected pulse from the detected object. *See, e.g.,* The Wikipedia Encyclopedia, *available at* <http://www.wikipedia.org>. Accordingly, the ultrasonic sensor of the Adachi et al. reference transmits an ultrasonic pulse toward the terrain surrounding the robot body and determines a distance from the terrain based on the received ultrasonic pulse reflected from the terrain. As such, applicants respectfully submit that the sensor of the Adachi et al. reference can measure ***solely a vertical distance*** between the sensor and the terrain at any given moment and ***cannot sense a presence of a slope*** because the vertical distance between the ultrasonic sensor and any point on the slope of the floor under the robot would be constant.² Further, applicants respectfully submit that the ultrasonic sensor of the Adachi et al. reference cannot sense a slope of a floor ***only directly under*** the legs of the robot, as currently recited in claims 1, because the distance between the sensor and the floor under the robot's feet would be vertical and constant.

Therefore, applicants respectfully submit that the ultrasonic sensor of the Adachi et al. reference fails to teach or even remotely suggest a "slope-detection means for sensing a slope of a floor, the slope of the floor defined only directly under the two or more legs of the

¹ The Adachi et al. reference, Section 3, Last paragraph.

² Applicants respectfully point out that a sloped floor would cause a body tilt along a direction of the slopes, so any parts of the tilted body, e.g., including a sensor attached to the body, would be tilted as well. Accordingly, a distance between the sensor and the floor would remain unchanged.

ambulatory robot.” Applicants, therefore, respectfully reiterate that the Jinichi et al. and the Adachi et al. references, whether alone or in combination, fail to disclose or even remotely suggest a means for sensing a slope as recited in claim 1, and therefore, claim 1 is allowable for at least this reason.

Independent claims 7 and 13 were amended to include limitations of claims 11 and 14 and 17, respectively. Since claims 11 and 17 were indicated as including allowable subject matter,³ applicants respectfully submit that claims 7 and 13 are allowable over the cited prior art.

Lack of Motivation to Combine

In addition, applicants respectfully maintain that the proposed combination of the Jinichi et al. and the Adachi et al. references is unworkable. It is well-settled law that for a claimed invention to be rejected on grounds of obviousness, “some objective teaching in the prior art or ... knowledge generally available to one of ordinary skill in the art would [suggest an] individual **to combine the relevant teachings** of the references.” *Tec Air Inc. v. Denso Manufacturing Michigan Inc.*, 52 USPQ2d 1294, 1298 (Fed. Cir. 1999) (*emphasis added*). There is no motivation to combine, however, if the proposed combination and/or modification changes the principle of operation of the primary reference. See, MPEP § 2143.01.

Applicants respectfully note that the Jinichi et al. reference is directed toward a humanoid-type robot that walks on two legs. *The Jinichi et al. reference*, Abstract; FIG. 1. Applicants further note that the Adachi et al. reference, on the other hand, is directed toward a robot moving on four legs/wheels of different sizes. In particular, the different sizes/structure of legs of the robot in the Adachi et al. reference provide a robot that can propel its back legs over the main body in order to flip over large obstacles, e.g., steps. *The Adachi et al. reference*, FIG. 7 and corresponding text. Applicants respectfully submit that

³ Page 6 of Office action dated January 10, 2008.

the Office action fails to provide sufficient evidence to support why would one of ordinary skill in the art consider incorporating any of the features of the vehicle-type robot of the Adachi et al. reference into the humanoid-type robot of the Jinichi et al. reference.

Applicants respectfully traverse the assertion on pages 3 and 5 of the Office action of January 10, 2008, that the motivation would be “using a sensing means to determine the condition of the terrain surrounding the robot to automatically switch between locomotive modes” and detecting “the slope of the floor surface and obstacles such as steps [in order to] allow[] the robot to adapt physically to the environment... by braking/locking the front wheels to increase stabilization over uneven ground.” Firstly, the ability of the robot of the Adachi et al. reference to adapt to the environment upon sensing obstacles, e.g., switch locomotive modes, lock front wheels, propel back legs over body, is *design-specific* and intended for a *four legged/wheel robots*. Such features are not applicable in the *two-legged humanoid-type robot* of the Jinichi et al reference. Secondly, even if, *arguendo*, the ultrasonic sensor of the Adachi et al. reference were to be incorporated into the robot of the Jinichi et al. reference, the principle design of the robot of the Jinichi et al. reference would have to change. More specifically, in order to detect obstacles on the ground, the ultrasonic sensor of the Adachi et al. reference would have to extend away from a main vertical axis of the two-legged robot, i.e., to be able to send pulses to the ground without interference with robot parts, and rotate around the vertical axis. Such an extending and rotating sensor, however, would interfere with operation of the robot’s body, e.g., motion of legs and/or arms, and therefore, would require re-design of the robot. Applicants, therefore, respectfully submit that one of ordinary skill in the art would have been *discouraged* from incorporating features of the Adachi et al. reference into the Jinichi et al reference. Applicants, therefore,

respectfully reiterate that no motivation exists to combine the Jinichi et al. and the Adachi et al. references.⁴

In view of the above, applicants respectfully submit that the Jinichi et al. and the Adachi et al. references cannot be said to suggest the subject matter of the present invention, much less propose a proper modification thereof to provide the robot as recited in claim 1. Accordingly, applicants respectfully submit that claims 1, 7, and 13 are allowable over the cited references. Claims 2-4, 6, 8-10, 12, 15, 16, and 18 depend from claims 1, 7, and/or 13, and therefore, are allowable for at least the same reasons. Therefore, applicants respectfully request favorable reconsideration and withdrawal of the rejection of claims 1-4, 6-10, 12, 15, 16, and 18 under 35 U.S.C. § 103(a).

D. Asserted Obviousness Rejection of Claims 19 and 20

In the outstanding Office Action Made Final, claims 19 and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Jinichi reference in view the Adachi et al. reference and further in view of the Takenaka et al. reference. The rejection is respectfully traversed for at least the following reasons.

Applicants respectfully note that the Jinichi et al. and the Adachi et al. references, as discussed above, fail to teach or suggest a slope-detector as recited in claim 13. The Takenaka et al. reference fails to teach the elements indicated above as missing from the Jinichi et al. and the Adachi et al. references. Accordingly, applicants respectfully submit that claims 19 and 20 are allowable for at least the reasons set forth above regarding claim 13.⁵

⁴ Applicants further submit that even if, *arguendo*, the ultrasonic sensor of the Adachi et al. reference were to be incorporated into the torso or head of the robot of the Jinichi et al. reference, as suggested by the Examiner during the interview of May 30, 2008, the principle design of the robot of the Jinichi et al. reference would still have to change because an ultrasonic sensor in the torso or head cannot detect obstacles directly under the legs of the robot.

⁵ As an additional matter, applicants respectfully point out that the teachings of the Takenaka et al. reference, as cited on page 6 of the Office action of January 10, 2008, teach away from the present application. For example,

E. Allowable Subject Matter

Applicants appreciate the Examiner's indication of allowable subject matter in claims 5, 11 and 17. It is respectfully submitted, however, that all of the pending claims are in condition for allowance for at least the reasons set forth above.

F. New Claims 21-24

Claims 21-24 are added by the instant amendment, as supported at least by paragraphs [0049], [0051], and [0054] of the original specification as filed, respectively. No new matter is added. Applicants respectfully request entry and examination of claims 21-41.

G. Conclusion

The above remarks demonstrate the failings of the outstanding rejections, and are sufficient to overcome them. However, while these remarks may refer to particular claim elements, they are not intended to, nor need they, comprehensively address each and every reason for the patentability of the claimed subject matter over the applied art. Accordingly, applicants respectfully submit that the claims are allowable for reasons including, but not limited to, those set forth above, and patentability of the claims does not depend solely on the particular claim elements discussed above.

If the Examiner believes that additional discussions or information might advance the prosecution of the instant application, the Examiner is invited to contact the undersigned at the telephone number listed below to expedite resolution of any outstanding issues.

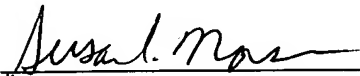
paragraphs [0005]-[0009], cited in the Office action as teaching the sensor recited in claims 19-20, specifically list shortcomings of the inclination sensor, e.g., soft material on the shoe soles may decrease accuracy.

In view of the foregoing remarks, reconsideration of this application is earnestly solicited, and an early and favorable further action upon all the claims is hereby requested.

Respectfully submitted,

LEE & MORSE, P.C.

Date: June 26, 2008



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PETITION and
DEPOSIT ACCOUNT CHARGE AUTHORIZATION

This document and any concurrently filed papers are believed to be timely. Should any extension of the term be required, applicant hereby petitions the Director for such extension and requests that any applicable petition fee be charged to Deposit Account No. 50-1645.

If fee payment is enclosed, this amount is believed to be correct. However, the Director is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 50-1645.

Any additional fee(s) necessary to effect the proper and timely filing of the accompanying-papers may also be charged to Deposit Account No. 50-1645.